

CHEMICALS, THE ENVIRONMENT, AND YOU

Massachusetts Science Learning Standards: Grades 6 — 8

| Lesson | Standard | Description |
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| 2 | Life 4 | Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organisms. |
| 2, 4 | Physical 3 | Recognize that the measurement of volume and mass requires understanding of the sensitivity of measurement tools (e.g., rulers, graduated cylinders, balances) and knowledge and appropriate use of significant digits. |
| 1 | Physical 5 | Recognize that there are more than 100 elements that combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter. |
| 2, 4 | Inquiry 1 | Formulate a testable hypothesis. |
| 2, 4 | Inquiry 2 | Design and conduct an experiment specifying variables to be changed, controlled, and measured. |
| 2, 3, 4 | Inquiry 3 | Select appropriate tools and technology (e.g., calculators, computers, thermometers, meter sticks, balances, graduated cylinders, and microscopes), and make quantitative observations. |
| 2, 3, 4, 6 | Inquiry 4 | Present and explain data and findings using multiple representations, including tables, graphs, mathematical and physical models, and demonstrations. |
| 2, 3, 4, 6 | Inquiry 5 | Draw conclusions based on data or evidence presented in tables or graphs, and make inferences based on patterns or trends in the data. |
| 2, 3, 4, 6 | Inquiry 6 | Communicate procedures and results using appropriate science and technology terminology. |
| 2, 3, 4, 5, 6 | Inquiry 7 | Offer explanations of procedures, and critique and revise them. |

Massachusetts Mathematics Learning Standards: Grades 6, 7, 8

Grade 6

| Lesson | Standard | Description |
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| 2, 4 | 6.N.4 | Demonstrate an understanding of fractions as a ratio of whole numbers, as parts of unit wholes, as parts of a collection, and as locations on the number line. |
| 2, 4 | 6.N.5 | Identify and determine common equivalent fractions, mixed numbers, decimals, and percents. |
| 2, 4 | 6.N.9 | Select and use appropriate operations to solve problems involving addition, subtraction, multiplication, division, and positive integer exponents with whole numbers, and with positive fractions, mixed numbers, decimals, and percents. |
| 2, 4 | 6.N.13 | Accurately and efficiently add, subtract, multiply, and divide (with double-digit divisors) whole numbers and positive decimals. |
| 2, 3 | 6.N.15 | Add and subtract integers, with the exception of subtracting negative integers. |
| 2, 3, 4 | 6.P.4 | Represent real situations and mathematical relationships with concrete models, tables, graphs, and rules in words |

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| | | and with symbols, e.g., input-output tables. |
| 3 | 6.P.6 | Produce and interpret graphs that represent the relationship between two variables in everyday situations. |
| 3, 4 | 6.M.3 | Solve problems involving proportional relationships and units of measurement, e.g., same system unit conversions, scale models, maps, and speed. |
| 3 | 6.D.2 | Construct and interpret stem-and-leaf plots, line plots, and circle graphs. |
| Grade 7 | | |
| Lesson | Standard | Description |
| 2, 4 | 7.N.1 | Compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents. |
| 4 | 7.N.2 | Use ratios and proportions in the solution of problems involving unit rates, scale drawings, and reading of maps. |
| 2, 4 | 7.N.6 | Use the inverse relationships of addition and subtraction, and of multiplication and division, to simplify computations and solve problems, e.g., multiplying by $\frac{1}{2}$ or 0.5 is the same as dividing by 2. |
| 4 | 7.N.7 | Estimate and compute with fractions (including simplification of fractions), integers, decimals, and percents (including those greater than 100 and less than 1). |
| 2, 4 | 7.N.9 | Select and use appropriate operations—addition, subtraction, multiplication, division, and positive integer exponents—to solve problems with rational numbers (including negatives). |
| 2, 3, 4 | 7.P.1 | Extend, represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic expressions. Include arithmetic and geometric progressions, e.g., compounding. |
| 3 | 7.P.6 | Use linear equations to model and analyze problems involving proportional relationships. Use technology as appropriate. |
| 2, 4 | 7.M.1 | Select, convert (within the same system of measurement), and use appropriate units of measurement or scale. |
| 2, 3, 4 | 7.D.1 | Select, create, interpret, and utilize the following tabular and graphical representations of data: circle graphs, Venn diagrams, stem-and-leaf plots, tables, and charts. |
| Grade 8 | | |
| Lesson | Standard | Description |
| 2, 4 | 8.N.1 | Compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents. |
| 4 | 8.N.3 | Use ratios and proportions in the solution of problems, in particular, problems involving unit rates, scale factors, and rate of change. |
| 2, 4 | 8.N.12 | Select and use appropriate operations—addition, subtraction, multiplication, division, and positive integer exponents—to solve problems with rational numbers (including negatives). |
| 2, 4 | 8.M.1 | Select, convert (within the same system of measurement), and use appropriate units of measurement or scale. |
| 2, 3 | 8.D.1 | Describe the characteristics and limitations of a data sample. Identify different ways of selecting a sample, e.g., |

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| | | convenience sampling, responses to a survey, random sampling. |
| 2, 3, 4 | 8.D.2 | Select, create, interpret, and utilize various tabular and graphical representations of data, e.g., circle graphs, Venn diagrams, scatterplots, stem-and-leaf plots, box-and-whisker plots, histograms, tables, and charts. Differentiate between continuous and discrete data and ways to represent them. |

Massachusetts English Language Arts Learning Standards: Grades 6, 7, 8

| Lesson | Standard | Description |
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| 2, 4, 5, 6 | 1.3 | Apply understanding of agreed-upon rules and individual roles in order to make decisions. |
| 1, 2, 4, 5, 6 | 4.17 | Determine the meaning of unfamiliar words using context clues (<i>definition, example</i>). |
| 1, 2, 4, 5, 6 | 4.20 | Determine the meaning of unfamiliar words using context clues (<i>contrast, cause and effect</i>). |
| 1, 2, 4, 5, 6 | 8.10 | Restate main ideas. |
| 1, 2, 4, 5, 6 | 8.15 | Locate facts that answer the reader's questions. |
| 1, 2, 4, 5, 6 | 8.16 | Distinguish cause from effect. |
| 1, 2, 4, 5, 6 | 8.17 | Distinguish fact from opinion or fiction. |
| 1, 2, 4, 5, 6 | 8.22 | Identify and analyze main ideas, supporting ideas, and supporting details. |
| 1, 2, 4, 5, 6 | 13.21 | Recognize use of arguments for and against an issue. |
| All lessons | 13.22 | Identify evidence used to support an argument. |
| 2, 4, 6 | 19.16 | Write brief research reports with clear focus and supporting detail. |
| 2, 4, 5 | 19.17 | Write a short explanation of a process that includes a topic statement, supporting details, and a conclusion. |
| 1, 4, 5 | 19.22 | Write and justify a personal interpretation of literary, informational, or expository reading that includes a topic statement, supporting details from the literature, and a conclusion. |
| 1, 2, 4, 5, 6 | 20.2 | Use appropriate language for different audiences (<i>other students, parents</i>) and purposes (<i>letter to a friend, thank you note, invitation</i>). |
| 1, 2, 4, 5, 6 | 22.7 | Use additional knowledge of correct mechanics (<i>apostrophes, quotation marks, comma use in compound sentences, paragraph indentations</i>), correct sentence structure (<i>elimination of fragments and run-ons</i>), and correct standard English spelling (<i>commonly used homophones</i>) when writing, revising, and editing. |
| 1, 2, 4, 5, 6 | 22.8 | Use knowledge of types of sentences (<i>simple, compound, complex</i>), correct mechanics (<i>comma after introductory structures</i>), correct usage (<i>pronoun reference</i>), sentence structure (<i>complete sentences, properly placed modifiers</i>), and standard English spelling when writing and editing. |
| 1, 2, 4, 5, 6 | 23.7 | Group related ideas and place them in logical order when writing summaries or reports. |
| 2, 4, 5, 6 | 23.8 | Organize information about a topic into a coherent paragraph with a topic sentence, sufficient supporting detail, and a concluding sentence. |

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| 1, 2, 4, 5, 6 | 24.4 | Apply steps for obtaining information from a variety of sources, organizing information, documenting sources, and presenting research in individual projects: differentiate between primary and secondary source materials; differentiate between paraphrasing and using direct quotes in a report; and organize and present research using the grade 7–8 Learning Standards in the Composition Strand as a guide for writing. |
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| Massachusetts Comprehensive Health Learning Standards: Grade 8 | | |
| Lesson | Standard | Description |
| 5 | 2.13 | Explain the personal benefits of making positive health decisions and monitor progress towards personal wellness. |
| 5 | 3.11 | Analyze dietary intake and eating patterns. |
| All lessons | 7.5 | Apply attentive listening, feedback, and assertiveness skills to enhance positive interpersonal communication. |
| 5 | 8.5 | Identify ways individuals can reduce risk factors related to communicable and chronic diseases. |
| 4 | 8.7 | Explain the need to follow prescribed health care procedures given by parents and health care providers. |
| 4 | 12.8 | Identify ways consumer decisions and actions can influence physical and mental health. |
| 4, 5 | 12.a | Identify the contribution of state and federal public health laws and of government agencies for the protection of the consumer. |
| 1, 5, 6 | 13.4 | Identify individual and community responsibility in ecological health. |
| 1, 5, 6 | 13.5 | Evaluate solutions generated by science, technology/engineering, and individuals regarding ecological health problems (such as energy use, water use, waste disposal, and food shortage). |
| 5, 6 | 14.a | Describe local, state, and national laws and regulations that promote public health and the safety of the community. |